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ABSTRACT

The modern history of sports medicine is chronicled in a discussion of the first writings in English on sports medicine. What may have been the first writing in English is a section on first aid in the ENCYCLOPEDIA OF SPORT, published in England in 1898. It describes injuries commonly sustained in angling, boxing, cricket, cycling, football, hunting, lawn tennis, mountaineering, rowing, and shooting. Several other books were published in Europe in other languages during the years before the first World War, including the first comprehensive work on sports injuries in a single volume by one author. In 1931, two books on sports medicine appeared in English--INJURIES AND SPORT, A GENERAL GUIDE FOR THE PRACTITIONER and TRAINING, CONDITIONING, AND THE CARE OF INJURIES. INJURIES AND SPORT by Charles Brehmer Heald is divided into two parts. The first deals with the process of the repair of injuries, the general principles of diagnosis, first aid, electrotherapeutics, physio-therapeutics, factors modifying recovery, and complications of injuries. He advocates one method of treatment throughout--anodal galvanism, the application of mild direct currents to the injury. The second part of the book deals with the injuries classified according to the body parts affected. Walter Meanwell's book, TRAINING, CONDITIONING, AND CARE, is brief, more oriented to training, and not comprehensive in its discussion of injuries. He devotes considerable space to diet, and particularly to debunking many beliefs commonly held by coaches and athletes at the time. In 1939, Dr. August Thorndike, Jr., published ATHLETIC INJURIES: PREVENTION, DIAGNOSIS, AND TREATMENT, thought by most to be the pioneer publication in the field, in the United States. (MM)

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The First Sports Medicine Books in English .

INTRODUCTION

Although the modern history of Sports Medicine lies within the memories of some who are still living, it has not been collected and recorded so far to the extent that priorities can be clearly established. "The History of the Development of Sports Sciences and Medicine" which appeared as the Introduction to the Encyclopedia of Sports Sciences and Medicine (1) was an attempt to begin this process, but has not been followed by other publications in English, although interest in Sport History has developed very rapidly in the past five years.

What may have been the first writing in English which can be characterized as Sports Medicine in terms of relating to the medical problems encountered by those engaging in a variety of sports is a section on first aid in "The Encyclopedia of Sport" (2) which was published in England in 1898. The authors, J. B. Byles and Samuel Osborn, described injuries commonly sustained in angling, boxing, cricket, cycling, football, hunting, lawn tennis, mountaineering, rowing and shooting and their management. On the continent, Dr. Siegfried Weissbein of Berlin produced in 1910 a two-volume work entitled "Hygiene des Sports", (3) which appears to be a collection of papers presented at a conference of the same title. In the first volume, the effects of sports activities on the function of the various organ systems of the body, problems relating to sports clothing and first aid for injuries sustained in the sports which were common at that time were discussed. In the second, separate chapters were devoted to games and sports suitable for all, including children and elderly persons, were described and discussed. The first comprehensive work on sports injuries in a single volume by one author, however, appears to be "Die Sportverletzungen" which comprised one part of "The Encyclopedia of Surgery" edited

SP010 529

'y Professor P. Van Bruns of Tubingen (4), published in 1914. It was written by Dr. G. Van Saar and dealt almost exclusively with the injuries characteristic of certain sports and their treatment. World War I put a stop to further publications in this field until 1925 when Dr. Felix Mandell published a work on the surgery of sports injuries (5).

SPORTS MEDICINE BOOKS IN ENGLISH

In the year 1931, two books on Sports Medicine appeared in English (6,7). The authors were both born in England, but one had emigrated to the United States at an early age. Both had strong interests and experience in physical education. Both were generalists in medicine but one gradually developed a special interest in physical medicine while the other combined coaching with medical practice. Neither knew of the other, nor apparently of any of the European publications which had preceded theirs.

Charles Brehmer Heald was born December 3rd, 1882 at Bowden, Cheshire, England. He attended Caius College, Cambridge and rowed for the College at the Henley Regatta in 1904 when they won the Thames Cup. After receiving his M.A. there, he went on to medical studies at St. Bartholomew's Hospital in London where he received his LRCP in 1909 and his MB B Chir in 1910. Following the custom for medical students at the time, he spent a year in Germany, at the University of Freiburg, but, unusually, also spent a year studying Swedish gymnastics in Stockholm. When he returned to England he joined the Board of Education in London and was influential in improving child health by starting gymnastic programs in all of the Board's schools. He took his MD at Cambridge in 1913.

With the outbreak of World War I he joined the Royal Medical Corps and soon became involved in the organization of the Royal Air Force Medical Service. In 1965 he combined his recollections of this period with surviving official records to write a small book under the title of "The Genesis of Aviation Medicine" (8). It was published by the Cabinet Office Historical Section in a limited edition of 40 copies. Following the War he was appointed Physical Medicine Consultant to the Royal Free Hospital in London. His main responsibilities were in the treatment of fractures and soft tissue injuries.

When the specialty of orthopedics developed, and took over very largely the treatment of fractures, he developed a practice in which he dealt chiefly with Rheumatic Diseases. His publications from 1924 on show an increasing interest in the techniques of physical medicine with an emphasis on ultra-violet and electrical therapy, especially in relation to the treatment of rheumatism. A handbook for patients entitled "Your Garden and Your Rheumatism" (9) was published by the Arthritis and Rheumatism Council in 1964. The only paper dealing directly with Sports Medicine, "Sports Injuries and Their Treatment" (10) appeared in the same year as his book.

"Injuries and Sport, A General Guide for the Practitioner" (6) appeared sometime in the Spring of 1931. The Oxford Press does not have a specific date of publication but is reasonably sure of the season. In his preface, the author states, "So far as I know, this is the only work of its kind that has been published in English." He was apparently correct, because although "Training, Conditioning and the Care of Injuries" (7) by Walter E. Meanwell, MD and Knute K. Rockne was published in the same year, the Democrat Printing Company (now Webcrafters) of Madison, Wisconsin left no exact date of publi-

cation either. There is a bill for the printing of the book in the amount of $408.00 dated August 31, 1931. A spokesman for the successor firm says that it is likely that it was published sometime in July.

In the opening paragraph of his Preface, Dr. Heald states something of his philosophy and his reason for writing "Injuries and Sport". He says, "Practically no game worth playing is free from some risk of injury to limb, if not to life. The risk is sometimes severe, as in hunting, motor-cycle racing, or Rugby football; sometimes slight and subjective, as in tennis or golf, but the element is one which healthy-minded people would never consent to abolish. Since practically every able-bodied person in civilized countries plays games of some sort, the incidence of major and minor injuries of sport is very large. Some of these are of fairly well-recognized type, but others, especially injuries of soft structures, are exceedingly obscure and troublesome, and the practitioner who is confronted with them will consult standard textbooks in vain. It is to assist those who have to deal with such injuries that this book has been compiled."

The book is divided into two parts. The first part, comprising 141 pages, deals with the process of repair of injuries, the general principles of diagnosis of injuries, first aid, including splinting and support, "electro-therapeutics", "physio-therapeutics", factors modifying recovery from injury and the complications of injuries. As the author states, "Throughout the sections on treatment I have stressed continually one method which, though little used, has been shown by long and practical experience to be invaluable. This is anodal galvanism, the application of very mild direct currents to the injury in a centripetal direction. Its extreme simplicity makes it an ideal technique for the general practitioner and it is so efficacious that it deserves to be used much more widely than it is at present."

The second part of the book, comprising 327 pages, deals with the injuries of sport classified according to the body parts affected. Where an injury is particularly characteristic of a sport, that sport is mentioned and the mechanism of the injury usually described, illustrated (by some excellent action photographs) or both. Each chapter is divided into three parts: general considerations, diagnosis and treatment. The discussion of treatment is extensive and specific with emphasis on active rehabilitation. True to the author's promise in his Preface, electro-therapeutics is recommended along with almost every treatment by other means.

One of the unusual features of the book is a set of endpapers in which the sections of the book dealing with fractures and soft tissue injuries are noted by page number on two skeletonized figures as an easy reference guide. There is an appendix on Recreational Therapy which lists the advantages and drawbacks of using specific sports for convalescent exercise and reconditioning. In another appendix the main points regarding diagnosis and treatment of injuries to each body part are summarized in tabular form. The author's knowledge of sports must have been extensive since he describes characteristic injuries occurring in 36 different sports.

Walter E. Meanwell was born in Leeds, England in 1884. He was the youngest of 6 children. When he was three years old his parents emigrated to the United States, eventually settling in Rochester, New York. As a young man there he joined the Rochester Athletic Club and became captain of both their baseball and basketball teams. He was also three-time national amateur lightweight wrestling champion of Canada and did some amateur boxing. He attended Yale College for a short time but did not play on any varsity sports teams. He left there to become Athletic Director at the high school in Glen Mills, Pennsylvania. After a short stay there he went to Baltimore as Director of the Clifton Park

Athletic Field, becoming Supervisor of Boys' Activities for the Playground Association and Supervisor of the Public Athletic League.

During his early years in Baltimore he entered the University of Maryland and received his MD in 1909. The following year, while interning at the Maryland General Hospital, he functioned as the Supervisor of Recreation for the city of Baltimore. In the academic year 1910-1911 he was Athletic Director at Loyola University in Baltimore. It was during his years as a playground supervisor that he developed a boy's team in a settlement house which won 60 games and lost only one in two years of competition. Here he developed the basic patterns of play which were to make him so successful as a basketball coach in later years, the short pass, the criss-cross offense, the pivot play, the short shot and the tight five-man defense.

In 1911, Dr. Meanwell came to the University of Wisconsin as Director of the Gymnasium, Head Basketball Coach and Associate Professor of Physical Education. Basketball had started at Wisconsin in 1898, only 6 years after its introduction at Springfield College. There had been a winning tradition since the fourth season of play but never a truly outstanding team. With only two veterans returning from the 1910-11 team, Meanwell produced a team that won 15 games and lost none, becoming Western (Big Ten) Conference Champion. In the next two years his teams lost only 1 game while winning 29, taking two more Conference Championships, repeating in 1916 with a 20-1 record. In his first 6 years at the University his teams won 92 games and lost only 9.

In 1917 Dr. Meanwell joined the U.S. Army as a captain in the Medical Corps. He was soon assigned to the University of Missouri where he became Professor of Physical Education, Director of the Department of Physical Education and Basketball Coach. Missouri had a poor record of success in basketball, but in two years of coaching there Meanwell produced teams that

had 15-1 and 17-1 records and won two conference championships. With the ending of World War I he returned to the University of Wisconsin as Professor of Physical Education, Medical Supervisor of the Teams and Basketball Coach. In the next 10 years his teams won 4 more conference championships and were twice runner-up. In 307 college games that he coached his teams won 245 for a winning percentage of almost 80% over a span of 18 seasons.

Dr. Meanwell's first book "Basketball for Men" was published in 1922 (11). Because of his unparalleled success as a coach up till that time it went through 4 editions in 18 months and was adopted as a text for basketball classes in more than 40 institutions. He published a revision in 1924 under the title "The Science of Basketball for Men" (12) and this book was equally successful. Both were printed by the Democrat Printing Company of Madison. Much of the material in these two books dealing with training, conditioning and taping was carried over to his final work of 1931 in which his old friend Rockne collaborated.

Dr. Meanwell's book is quite different from Dr. Heald's. It is brief (179 pages), more oriented to training, and not comprehensive in its discussion of injuries. It reflects the author's major pre-occupation with basketball. It is more like a trainer's manual than a handbook for physicians with a broad interest in Sports Medicine. It is divided into four parts: 1. a general introduction; 2. the training and conditioning of a football team; 3. the training and conditioning of a basketball team; and 4. the prevention and care of minor injuries and illness.

The formal introduction was written by William A. Mowrey, MD, formerly Professor of Clinical Medicine at the University of Wisconsin Medical School and, at the time of his writing, the Chief Physician in the Department of Student Health at the University of Wisconsin. His subtitle is "The Relation

of the Athletic Trainer to the Problem of Student Health". Referring to Dr. Meanwell's "special training in pathology and orthopedics" and his status as "an eminent basketball coach", he states that "No more ideal situation could exist than when the medical supervisor and coach are one". He also notes that although Dr. Meanwell had previously undertaken medical supervision of "all athletic teams at the University of Wisconsin under the general direction of the Student Health Service" as well as coaching the basketball team, he had now been forced to confine his medical supervision to that team due to the increasing enrollment in the University.

In his portion of the Introduction which he calls "The Necessity for Specialized Training in the Care of the Body", Dr. Meanwell indicates that he is directing his book primarily to the coach-trainer. "Medical and other scientific terms are avoided where possible in favor of common English ones, in the interest of clear understanding by the average, non-medically trained coach." He takes issue with the impatient coach "who wants the boy back on his feet, not next Wednesday, but day before yesterday." The latest modern medical methods should be applied to the treatment of the athlete, he says, but "There are no secret, immediately successful, methods."

The second part, on the training of a football team, is divided into two chapters, "The Coach's Viewpoint" by Knute Rockne and "The Team Physician's Viewpoint" by Meanwell. Rockne and Meanwell became very close friends but it is uncertain as to how they met.

Rockne had little use for basketball but had to take over the coaching at Notre Dame in the season of 1920-1921 when the regular coach Gus Dorais was ill. Some time after that, Meanwell met Rockne in Chicago and later reported, "Rockne said, 'We're using the short pass and the long shot.'" This would have been of considerable interest to Dr. Meanwell since he is generally credited with having

introduced the short passing game into basketball prior to 1911. Meanwell had been conducting basketball coaching schools in the summer. In the mid-nineteen twenties he and Rockne began to work together in these schools, each teaching his respective specialty. This relationship lasted for four years, and evidently provided the basis for their collaboration in Dr. Meanwell's book. It is of some interest that Wisconsin did not play Notre Dame in basketball until the season of 1926-27, a game which Wisconsin lost. When Wisconsin lost again the following year, Notre Dame disappeared from the schedule and did not return until 10 years ago, after Meanwell had retired. With the exception of the colleges in the Big Ten conference, Dr. Meanwell did not reschedule opponents who beat his teams.

Rockne's chapter is of great interest not only for the light which it sheds on his philosophy of coaching football but also because it may well have been his last serious writing before he died, with the exception of his newspaper columns. The airplane crash which caused his death occurred on March 31, 1931, and this book was published during the summer of that year. It affected Dr. Meanwell so deeply that he would never go up in an airplane after that.

Rockne believed in very light work for the first 10 days of fall practice and no more than 40 minutes of scrimmage on any practice day after that. After November 1, he recommended reducing scrimmaging even further or eliminating it entirely. In spite of his reputation as an inspirational coach, famous for his half-time locker-room talks, he comes out strongly against over-enthusiastic phychological pressures. "Don't key the team up Saturday after Saturday - they will go dead on you". He recommends coaching the players in small groups and keeping them "happy and contented" by varying their work.

In his chapter Dr. Meanwell writes about off-season conditioning but advises

against reporting at playing weight or in too "fine" condition, which he feels leads to staleness later in the season. He echoes Rockne's advice on at least a week of conditioning before hitting the blocking or tackling dummies and scrimmaging. He recommends grass drills, short sprints and agility runs. In discussing weight loss he suggests free intake of water within 30 minutes of practice and moderate amounts of water during practice, a revolutionary suggestion for that period. He discusses staleness, emotional stress, preparation for the game and conduct of the coach and trainer during the game. He advises against heavy pre-game meals and a light diet generally during the season to avoid excessive weight gain.

In the third part of his book, Dr. Meanwell devotes chapters to the exercise and non-exercise phases of training a basketball team. He describes his practice of light training in October and November, with scrimmaging deferred until December. During his era as head coach the team never played its first game before December 4, and it was as late as December 15. One of his former players attests to the fact that the 90-minute drills on fundamentals before that were very demanding since everything had to be repeated until it was done exactly as he wanted it. This emphasis on technique was never relaxed during the season, and he was known on at least one occasion to conduct a short passing drill outdoors in the snow when a gymnasium was not available on a road trip. In his book, however, he says that "More teams are overtrained than undertrained".

Dr. Meanwell devotes considerable space to diet, and particularly to debunking many beliefs commonly held by coaches and athletes at that time (and still by some at present) such as the idea that drinking milk "cuts the wind". In general, he recommends what amounts to a high carbohydrate and fat diet, only moderate in its protein content. In a brief discussion of the pre-participation medical examination he stresses detection of any heart abnormality but cautions against rejecting athletes because of "murmurs" not accompanied by other medical

signs or symptoms. He recommends urinalysis as a guide to kidney problems, a careful check of the thyroid (in the era preceding the general use of iodized salt he was working at a university in the so-called "goitre belt"), a check for hernia and a test of color perception.

Part Four on "The Prevention and Care of Minor Injuries and Illness" contains chapters on: The Training Room; The Care of the Feet; The Principles of Treatment of Sprains; Injuries to the Knees; "Charlie Horse"; Floor Burns, Bruises and Cramps; Injuries to Arm, Shoulder, Head; Medical Conditions; Principles of Training; and Bandaging. Considerable space is devoted to foot care, which is so important to basketball players. He advocates treating all sprains by support with adhesive tape, especially ankle sprains, and allowing active motion while wearing a high shoe. His description of the mechanism of knee injuries would be considered up-to-date today. He describes manipulation of the knee for a torn meniscus and immobilization in a long leg cast for 10 days followed by active rehabilitation. He also recognizes the importance of injuries to the cruciate (which he calls "crucial") ligaments of the knee.

Dr. Meanwell's discussion of "Charlie Horse", is, I believe, the first to be found in the literature of Sports Medicine under that name. Unfortunately it does not shed any light on the origin of this interesting term, which remains obscure to this day in spite of several ingenious suggestions. He differentiates the muscle injury from the less severe tear of the muscle sheath or the equally serious "pulled tendon". His recommended treatment is just as is practiced today by knowledgeable sports physicians and trainers.

AFTERMATH

De. Heald continued to publish papers after 1931, the last in 1961 (13) dealing with "A New Concept of Capillary Circulation in Bone Cortex". He left

London in 1951 for Chipping Camden in Gloucestershire where he established The Rural Rheumatism Centre of the North Cotswolds. He continued to practice there until his retirement. He died February 9, 1974. His life appears to have been as peaceful and orderly as it was long.

By contrast, Meanwell's later career reflected his mercurial temper. When he became Athletic Director as well as Basketball Coach in 1933 he became involved in a power struggle with Tom Jones, the long time track coach and previous athletic director himself (1916-1924) and the redoubtable Clarence (Doc) Spears, the volatile and choleric football coach, who had been very successful with his first Wisconsin teams but was starting three years of non-winning seasons which led to h replacement by the former Notre Dame star Harry Stuhldreher. Meanwell had turned over his coaching to the greatest player he had ever coached, Harold (Bud) Foster beginning with the 1924-25 season. In the stormy year of 1936, amid battles waged partly in the public press, he was replaced by Stuhldreher as Athletic Director when he submitted his resignation and it was accepted.

He returned to his work in the Student Health Service where he remained until his retirement. He was finally able to spend more time with his family, his wife, the former Helen D. Grath, two daughters, since married, and a son, Walter A., who still occupies the family home on the shores of Lake Mendota. He was elected posthumously to the Basketball Hall of Fame not only as a coach and a teacher of thousands of other coaches, but for his many scientific contributions to the play of the game and his years of service on the Rules Committee. His ingenuity had also led him to invent the valveless basketball, but it was unfortunately patented by another coach before he could take steps to correct it.

Surprisingly, in an era when amateur sport was in the ascendant, neither book had much impact on the slowly developing field of Sports Medicine. In 1932, Herxheimer, Director of the Sports Medicine Clinic at the Charity Hospital in Berlin,

published his "Grundriss der Sportmedizin" (14) and made no mention of Heald's work, although he referred to the publication of A. V. Hill (15) in London five years previously. In England, no book on the general subject of sports medicine appeared until 30 years later when Colson and Armour published "Sports Injuries and Their Treatment" (16).

It was only seven years later in the United States, however, when Thorndike's "Athletic Injuries. Prevention, Diagnosis and Treatment" (17) was published. This work, which eventually went through five editions has been thought by most people, since they were unfamiliar with Meanwell's contribution, to be the pioneer publication in this field in the United States. Dr. August Thorndike, Jr. was in 1938 a Surgeon in the Department of Hygiene at Harvard University (which ministered to the health of the students), an Assistant in Surgery at the Harvard Medical School and an Associate Surgeon at the Children's Hospital in Boston. He describes in considerable detail the development of medical services for the athletic teams at Harvard, and bases his discussion of The More Common Types of Athletic Injuries on his experience in caring for the athletes of these teams beginning in 1932. He was apparently unaware of Dr. Meanwell's book, although he certainly must have known of him as a basketball coach, since his reputation in that field had been national for some time.

Over the long term, the development of any special field in medicine usually owes less to which publication has primacy than which has been the most influential. By all odds, between 1938 and 1962, Dr. Thorndike's book was most influential in the United States. It is appropriate, however, to recognize the pioneers, whose influence, perhaps through personal contacts, was possibly greater than we realize from the obscurity of their publications.

The author wishes to express his appreciation to the families and associates of Drs. Heald and Meanwell who assisted in the preparation of this manuscript

by loan of materials and personal reminiscence. Also to Mr. Harold (Bud) Foster, Dr. Meanwell's pupil, his successor as basketball coach and the only Wisconsin player in the Hall of Fame.

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